

**CLINCH RANGER DISTRICT
MANAGEMENT INDICATOR SPECIES (MIS)
TURKEY COVE VEGETATION MANAGEMENT PROJECT**

The Clinch Ranger District is proposing vegetation management in The Turkey Cove Project Area in compartments 2042, 2043, 2044, and 2059. As described in the Jefferson National Forest Revised Land and Resource Management Plan (Plan), MIS have been chosen to represent threatened and endangered species, species with special habitat needs, species commonly hunted, fished, or trapped (demand species), non-game species of special interest, and species that indicate effects to major biological communities. Specific habitat objectives related to these species are located in several places throughout the Plan. The monitoring program outlined in Chapter 5 of the Plan contains specific objectives for these management indicator species. During the course of identifying any issues pertaining to a project, MIS are considered.

Table 1. MIS selected for The Turkey Cove Vegetation Management Project Area.

Taxa	Selected as an MIS (Y/N)	Justification
Peaks of Otter salamander (<i>Plethodon hubrichti</i>)	N	Known only from the Peaks of Otter in Virginia
pileated woodpecker (<i>Dryocopus pileatus</i>)	Y	Detected in survey
ovenbird (<i>Seiurus aurocapillus</i>)	Y	Detected in survey
chestnut-sided warbler (<i>Dendroica pensylvanica</i>)	N	Not detected in survey, habitat could be created/enhanced with management activities, but the Project Area is probably too low in elevation to benefit this species
Acadian flycatcher (<i>Empidonax virescens</i>)	Y	Detected in survey, found across District, habitat present, habitat could be undisturbed or enhanced with management activities
pine warbler (<i>Dendroica pinus</i>)	Y	Not detected in survey, habitat could be created/enhanced with management activities
hooded warbler (<i>Wilsonia citrina</i>)	Y	Detected in survey
scarlet tanager (<i>Piranga olivacea</i>)	Y	Detected in survey
eastern towhee (<i>Pipilo erythrophthalmus</i>)	Y	Detected in survey
eastern wild turkey (<i>Meleagris gallopavo</i>)	Y	Detected in survey, habitat could be created/enhanced with management activities

black bear (<i>Ursus americanus</i>)	Y	Detected in survey
white-tailed deer (<i>Odocoileus virginianus</i>)	Y	Detected in survey
wild trout (brook trout <i>Salvelinus fontinalis</i> , brown trout <i>Salmo trutta</i> , and rainbow trout <i>Oncorhynchus mykiss</i>)	N	No wild trout detected in VDGIF or FS surveys.

For detailed discussion of the specific habitats or communities represented by the MIS, please refer to the Plan, Chapter 2 (Forest-wide Direction), pages 2-10 through 2-18 and the Final Environmental Impact Statement (FEIS) for the Plan, Chapter 3, pages 3-63 through 3-67, “Major Forest Communities,” “Pine and Pine-Oak.”

SPECIAL HABITAT INDICATORS

Special habitat attributes such as hard and soft mast, den trees, snags, downed wood, and brushy areas are necessary elements for certain species. A variety of Plan goals, objectives, and standards provide for the protection, restoration, and maintenance of these elements.

Table X. Population Trends among MIS Bird Species in Appalachian Mountain Region in Virginia. State bird population data are summarized from the on-line Breeding Bird Survey Data Application (Sauer et al 2015).

Species	Number of Observations	Trend 1966-2015	Trend 2005-2015	Relative Abundance
pileated woodpecker	56	+2.07	+2.53	+1.84
ovenbird*	55	+0.73	+1.52	+7.28
chestnut-sided warbler*	206	0.00	-0.63	1.91
acadian flycatcher	57	-0.79	-1.82	-7.06
pine warbler	51	0.82	-0.04	4.04
hooded warbler	51	0.78	0.70	2.09
scarlet tanager	55	0.70	1.58	5.50
eastern towhee	57	-1.37	-1.96	-15.88

*Appalachian Mountain regional data used instead of state data because of questions about the validity of the state-level dataset.

SNAGS AND DOWNED WOOD HABITAT INDICATOR: PILEATED WOODPECKER (*Dryocopus pileatus*)

The pileated woodpecker generally prefers mature deciduous forests ranging from bottomlands to uplands. Key habitat requirements include older mature forests with dead trees (snags) for nesting. Pileated woodpeckers will also nest in large dead limbs on live trees. Nests are large cavities they construct usually more than 30 feet above the ground. They feed on ants, insects, and insect larvae (mainly carpenter ants and wood-boring beetles) found by probing under the bark of standing trees and stumps or fallen logs. Some fruits and berries are taken in fall and winter. The pileated woodpecker is a permanent resident, and is an MIS for snag dependent wildlife. Breeding Bird Survey data suggest increasing population trends in Virginia over the last ten and fifty-year period (Table X).

Direct Effects and Indirect Effects

Wildlife habitat surveys found snags throughout the project area (project file). Even-aged management can affect pileated woodpeckers by removing snags and mature trees with dead limbs suitable for nesting. Thinning and regeneration treatments will mark and protect snags (see mitigation measures) which should lessen the impact of habitat loss through harvest. Timber management may provide more downed wood for the pileated woodpecker in harvest units without biomass removal, and prescribed burns through retention of tree tops and large limbs and trees lost to burn mortality. Forest harvest will reduce the amount of total acres of nesting habitat available to the pileated woodpecker in the project area due to the loss of mature trees, but may provide a beneficial effect to residual nesting birds outside of the harvest areas through enhanced foraging due to the potential increase in downed wood in units without biomass removal. In units with biomass removal, chipping of the residual wood and tops will limit the forage for pileated woodpeckers to retention trees and any mortality from subsequent prescribed burning in the harvest units. Herbicide treatment should have no direct effect on the pileated woodpecker since the targeted species are mostly herbaceous, brush species, or small native and nonnative trees that are not nesting or foraging resources for this species.

The **Proposed Action** will result in an approximate 439 acre reduction (except for leave trees) of existing mature forest for nesting, and loss of some of the cavities and snags found the area.

Cumulative Effects

The **Proposed Action** will reduce the amount of available nesting habitat (mature forest) by 439 acres through even-aged management. Prescribed fire will likely result in the loss of snags that burn and fall, but new snags should be created that will take the place of the lost nesting habitat. Cumulatively, these actions will reduce the available amount of mature nesting habitat by approximately 439 acres. The majority of the project area (90%) will remain as mature forest, herbicide treatments will target invasive or undesirable species not considered important to this species, and prescribed burning should either be benign or have a beneficial effect. The constructed roads, skid trails, and openings will represent a small net loss of potential future nesting habitat; because they will either be maintained in an open state or be slow to produce large trees. The dispersed skid trails will reforest naturally.

On private lands, timber management is likely to occur through small tracts being sold by individual landowners. No large-scale landowners or potential large projects are known in the analysis area that could cause a significant cumulative effect when combined with the proposed action. Additionally, the emerald ash borer *Agrilus planipennis* is active in the project area and throughout the surrounding forests on public and private lands; killing ash trees wherever they encounter them. Dead and dying ash trees will create snag habitat for the pileated woodpecker. There will be no significant negative cumulative effects on the pileated woodpecker from implementing the **Proposed Action**.

Based on the results of long-term monitoring data, pileated woodpeckers show overall stable population trends on the GWJNFs and increasing trends both statewide and across the Blue Ridge Mountain and Ridge and Valley Regions (Appendix G – MIS Population Trends Monitoring and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan). Pileated woodpeckers have the abundance and distribution across the Forests that will provide for their persistence into the foreseeable future. With the remaining mature forest, and the beneficial openings providing post-breeding foraging habitat and juvenile maturation and foraging habitat created through the harvest activities, there should be no cumulative effects to the pileated woodpeckers from the implementation of the proposed action alternative.

INTERIOR FOREST HABITAT INDICATOR: OVENBIRD (*Seiurus aurocapillus*)

Ovenbirds are interior forest habitat indicators, requiring mature deciduous forest interior with a moderately dense understory, preferring hilly terrain. They favor rather dry deciduous forests for breeding and will nest in mixed forests with a deciduous understory. They will glean prey from leaf litter or soil, seldom foraging in trees. Their nests are placed on the ground in leaf litter.

Ovenbirds are area sensitive, requiring relatively large forested patches. As ground nesters, they are especially vulnerable to predators (Robbins et al. 1989). While the need for large patches of mature forested habitat for nesting has been well documented for many migratory birds species, including ovenbirds, evidence is mounting that early successional habitats are also important for these same species during the critical time periods just after breeding and during migration (Anders et al. 1996 and 1998, Vega Rivera et al. 1998 and 1999, Pagen et al. 2000, and Hunter et al. 2001). Recent research has documented that post-breeding adults and fledgling ovenbirds (as well as many other mature forest bird species such as wood thrushes, red-eyed vireos, Kentucky warblers, black-and-white warblers, and hooded warblers) move from their nesting habitats in mature forests to areas characterized by dense, woody vegetation, abundant insect availability, and the presence of ripe fruits (Anders et al. 1998, Vega Rivera et al. 1998, 1999). These areas provide “safe havens” for molting, abundant food for the buildup of fat reserves for migration, and protection from predators. Habitats supporting this kind of vegetation, and where these species were found, include open oak, oak/pine, and pine woodlands, patches of early successional habitat resulting from insect infestation and natural disturbance such as ice storms, patches of early successional habitat where the overstory had been thinned or harvested in some way, areas

of second growth scrub/deciduous saplings located along forest borders and old fields, and mature riparian forests with a dense understory (Anders et al. 1998, Vega Rivera et al. 1998, 1999). The availability of post-fledgling habitat for juvenile birds such as ovenbirds near their nesting habitat is critical to their survival, due to the inexperience of juveniles in foraging and avoiding predators (Anders et al. 1998). Research found significantly fewer ovenbirds where uneven-aged management (thinning) has occurred compared to the pre-existing stands, but ovenbirds still foraged in the thinned stands (DeGraaf et al. 1991). Several studies have also documented the need for patches of early successional woody habitat within a largely forested landscape to provide abundant food resources and protective cover for migratory bird species during migration (Kilgo et al. 1999, Suthers et al. 2000, Hunter et al. 2001). These studies strongly recommend conservation strategies that maintain large tracts of mature forest, within which there is a mosaic of different forest types and ages (early and mid-successional forest stands), to provide the habitat requirements needed by migratory birds such as ovenbirds, during all their life stages here in North America. Breeding Bird Survey data suggest increasing population trends in Virginia over the last ten and fifty-year period (Table X).

Direct Effects and Indirect Effects

Even-aged management will result in a reduction of existing interior forest for ovenbird nesting, while creating early successional habitat suitable for post-breeding foraging and juvenile maturation and foraging. This species would be displaced from regeneration harvest units; however, approximately 90% of forest interior habitat would remain in the project area, and needed habitat would be available. Over time, the trees would regrow and the habitat would eventually become suitable to the ovenbird again. Thinning leaves most of the canopy, and creates some gaps that would benefit the ovenbirds, both for foraging habitat for fledglings and post-breeding times as described above. Prescribed burning may also create scattered tree mortality, resulting in new, small openings in the canopy. If prescribed burning is conducted during the dormant season, the ovenbirds would not be present in the area, so there would be no direct effect. Early growing season prescribed burning could affect nesting ovenbirds by destroying their nests. Herbicide treatments to remove competing vegetation could affect ovenbirds if the herbicides are applied during the nesting season and treatments occur near a nest. Construction of temporary roads, bladed skid trails, and landings could have a direct effect on the ovenbird by destroying nests and nesting sites. Dispersed skidding (skidding over the forest floor) could directly affect the ovenbird by crushing nests. Depending on how late in the nesting season the disturbance occurs, adult birds would be able to escape the immediate area and possibly nest elsewhere in the remaining mature forest.

The Proposed Action proposes to create 439 of early-successional habitat. **The No Action Alternative** would not alter the forest habitat. There would be no significant direct effect to the ovenbird from selecting any of the alternatives since thousands of acres of mature forest would remain in the project area. The proposed action might affect individual ovenbirds, but will have no effect on the species as a whole because of the significant amount of remaining mature forest habitat.

Cumulative Effects

On private lands, timber management is likely to occur through small tracts being sold by individual landowners. No large-scale landowners or potential large projects are known in the analysis area that could cause a significant cumulative effect when combined with the proposed action. Additionally, the emerald ash borer *Agrilus planipennis* is active in the project area and throughout the surrounding forests on public and private lands; killing ash trees wherever they encounter them. Dead and dying ash trees will create individual snags, but there are not large stands of ash inside the project area that could significantly contribute to any cumulative effects to forest interior species.

The **Proposed Action** will reduce the amount of available mature forest habitat by 439 acres through even-aged management and fragment some of the remaining mature forest. Prescribed fire will likely result in the loss of snags that burn and fall, but new snags should be created that will take the place of the lost nesting habitat. The majority of the project area (90%) will remain as mature forest, herbicide treatments will target invasive or undesirable species not considered important to this species, and prescribed burning should either be benign or have a beneficial effect. The constructed roads, skid trails, and openings will represent a small net loss of potential future nesting habitat; because they will either be maintained in an open state or be slow to produce large trees. The dispersed skid trails will reforest naturally. The **Proposed Action** will reduce available Forest Interior Habitat and fragment some areas, making them less suitable for ovenbirds. The surrounding forest will still provide mature, unfragmented habitat in large blocks. The Proposed Action will reduce the amount of available Forest Interior Habitat, but habitat remains; therefore, there will be no significant negative cumulative effects on the ovenbird from implementing the **Proposed Action**.

The **No Action Alternative** would retain all Forest Interior Habitat to remain intact and younger stands will continue to mature until they are suitable for the ovenbird. There would be a small positive cumulative effect to the ovenbird, since the mature forest would remain, but surrounding younger forests would mature and become suitable habitat for the ovenbird.

Based on the results of long-term monitoring data, ovenbirds show overall stable to increasing population trends on the GWJNFs and increasing trends both statewide and across the Blue Ridge Mountain and Ridge and Valley Regions (Appendix G – MIS Population Trends Monitoring and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan). Ovenbirds have the abundance and distribution across the Forests that will provide for their persistence into the foreseeable future, and with the abundance of mature forest nearby, there should be no cumulative effects to the ovenbird. With the remaining mature forest, and the beneficial openings providing post-breeding foraging habitat and juvenile maturation and foraging habitat created through the harvest activities, there should be no cumulative effects to the ovenbird from the implementation of the **Proposed Action**.

RIPARIAN HABITAT INDICATOR: ACADIAN FLYCATCHER (*Empidonax virescens*)

Acadian flycatchers are found in mature, moist riparian forests, along perennial streams and rivers. Nests are usually built in the deciduous trees, over a stream. They will sit near the stream on a branch anywhere from 10 to 40 feet off the ground, beneath the hardwood canopy, and forage after flying insects.

The Acadian flycatcher is an appropriate species to indicate management-induced changes to mature riparian forests. It is highly associated with mature deciduous forests along streams and bottomland hardwoods throughout the Forest. This species is selected to help indicate the effects of management activities on this type habitat. All the perennial streams provide habitat for this species. Acadian flycatchers were detected in surveys for this project and are a common riparian species on the Clinch Ranger District.

Direct Effects and Indirect Effects

The Proposed Action would create 439 acres of early successional upland habitat. Some riparian regeneration is allowed in the Ruffed Grouse Management Prescription, but 98% of the nesting habitat will be maintained throughout the proposed project area. Herbicides in this alternative may be used within the riparian zone, as long as it is beyond 30 feet from the streambank; however, there should be no effect to the Acadian flycatcher since the herbicide will be spot-applied to the target species, to remove competing vegetation. Prescribed burning should have no effect on the Acadian flycatcher since mature trees within the riparian zone would not be affected by the “cool” nature of the burn. If prescribed burning is conducted during the dormant season, the Acadian flycatcher would not be present in the area, so there would be no direct effect such as mortality.

The No-Action Alternative will result in no loss of existing mature forest for nesting, but due to a lack of early successional habitat, there would be a very limited amount of suitable habitat for post-breeding, juvenile foraging and maturation, and migration needs.

Cumulative Effects

The Proposed Action is to harvest timber through even and uneven-aged management, conduct herbicide treatments, and perform prescribed burning. These activities could create the necessary early successional habitat that may be used by Acadian flycatchers for post-breeding and juvenile maturation and foraging and could have a beneficial cumulative effect; riparian areas potentially containing nest trees are excluded from harvest, so there would be no cumulative effect to the Acadian flycatcher from the proposed activities in The Proposed Action.

The No-Action Alternative would allow forest processes to naturally occur in the project area. Little early successional habitat would be present for the post-breeding and juvenile maturation and foraging life-stages.

Based on the results of long-term monitoring data, Acadian flycatchers indicate overall stable population trends on the GWJNFs, but have exhibited significant declines across Virginia and the Appalachian Region (Appendix G – MIS Population Trends Monitoring

and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan). Though such trends are not apparent on the GWJNFs, the declining trends shown by USGS BBS data in populations of Acadian flycatcher throughout the larger regions of the Blue Ridge Mountains and Ridge and Valley Region are a cause for concern. Recent research strongly recommends conservation strategies that maintain large tracts of mature forest, within which there is a mosaic of different forest types and ages (early and mid-successional forest stands), as well as mature riparian forest, to provide the habitat requirements needed by migratory birds during all of their life stages here in North America, including the Acadian flycatchers (Kilgo et al. 1999, Suthers et al. 2000, Hunter et al. 2001). With the action alternative, combined with the maintenance of over 80% of forested acres in mature forest condition (Appendix G – MIS Population Trends Monitoring and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan), the GWJNFs should be able to provide the mosaic of forest types and ages recommended by research for migratory birds such as Acadian flycatcher during the life history stages (breeding, post-breeding, migration) during which they utilize GWJNF lands.

With designation of riparian corridors and their protection, no impacts would be expected upon local Acadian flycatcher populations. Prescribed burning may be allowed to occur in riparian areas, but no negative impacts are expected as the mesic conditions and heavy shade in riparian areas would result in very low intensity fires (“cool” burns). Herbicide application may benefit the Acadian flycatcher by removing the competitive plant species from the post-breeding, migration, and juvenile foraging, early successional habitat. Emerald ash borer could kill individual ash trees in the riparian areas, but significant mortality of the very low density of ash trees scattered through the analysis area will not cause a negative cumulative effect when combined with the proposed action. There should be no cumulative impacts to the Acadian flycatcher from implementation of the action alternative.

BIOLOGICAL COMMUNITY INDICATORS

Some species can indicate effects to major biological communities and whether management activities are successful in maintaining or restoring composition, structure and function of forest communities.

MID-AND LATE SUCCESSIONAL PINE AND PINE-OAK FOREST SPECIES: PINE WARBLER (*Setophaga pinus*)

The pine warbler is selected as a management indicator species (MIS) to represent pine and pine-oak forests. The pine warbler is closely associated with pine and pine-oak forests, generally occurring only where some pine component is present. While not among the common warblers, the pine warbler is considered the most appropriate MIS for the yellow pine habitat component. Nests are built in pines and foraging for insects occurs in the crowns of pines where they glean insects from needles and twigs (Hamel, 1992). Since the pine warbler is a neotropical migrant, arriving in spring and departing the Jefferson National Forest in the fall, declines in populations may be caused by events happening on the wintering areas south of the U.S. and not on the JNF.

Since the pine warbler is closely associated with pine and pine-oak forests, it therefore is an appropriate indicator of the effects of management in restoring and maintaining pine forests. It should be noted, however, that this species does not discriminate as to the condition of pine stands relative to mid- and under-story, and so would indicate little more than the presence of pine. In addition, because fire plays such a prominent role in the maintenance and restoration of this community type, the other management indicator identified for assessing effects to pine and pine-oak forest communities will be the number of acres of xeric pine and pine-oak forests and woodlands burned. This activity indicates the level of effort directed at maintaining or restoring the xeric pine and pine-oak communities.

Pine forests have been in serious recent decline on the national forest as a result of southern pine beetle epidemics and lack of fire needed to maintain their dominance. Therefore, they will be the focus of ecological restoration and maintenance in this and other portions of the national forest. Other bird species that may be associated with desired fire-maintained conditions were not deemed sufficiently likely to be present to be appropriate MIS. Understory plant species also were considered and found to be too universal in association to be appropriate MIS. Therefore, pine warbler and various habitat-based elements, such as amount and effectiveness of prescribed burning, will be used to indicate effects of management on species associated with this community.

The future distribution of pine and pine-oak forest in the Turkey Cove Project Area will depend upon the amount and effectiveness of prescribed burning. Proposed activities of prescribed burning, under-planting, timber stand improvement and herbicide application should enhance existing habitat conditions within xeric pine and pine-oak forests above their current levels. Prescribed fire on a 4 to 20 year rotation (depending upon site conditions) will enhance habitat attributes such as grassy understories and standing snags needed by several declining bird species (Dickson 2001). Analysis indicates that with management as proposed for the Turkey Cove project, in 50 years this habitat element will be relatively abundant and well distributed across the forest (Plan).

Direct Effects and Indirect Effects

The Proposed Action would mean an increase of acres of pine and pine-oak forest habitat for the pine warbler; at the same time, grass and herbaceous habitat under the pine and pine-oak canopy for post-breeding, migration, and juvenile foraging and maturation could be created. Approximately 90% of the project area would remain in mature mixed forest, and the pine and pine-oak habitat preferred by the pine warbler would increase for its nesting and foraging needs. This alternative has proposed prescribed burning activities. If the burn is conducted during the dormant season, there would be no pine warblers in the area; therefore, there should be no effect to the pine warbler from these activities. At present, there are no pine warblers in the project area. As pine habitat is created and enhanced, they may be attracted to the newly created habitat and begin nesting in the Project Area. At that point, individual nesting pairs could be disturbed by growing season burning. The benefits of growing season burning over time (accelerated pine habitat creation) would outweigh any transient negative effects of growing-season burning on this species. Herbicides would be used in this alternative, but there should be no effect to the

pine warbler since the treatments are spot treatments to remove competing vegetation; brushy vegetation and small, widely scattered *Ailanthus* trees would receive the treatment.

The No-Action Alternative will result in no addition of pine and pine-oak forest for nesting and foraging, and there will be no additional amount of suitable grass and herbaceous habitat for post-breeding, migration, and juvenile foraging and cover needs.

Cumulative Effects

No known activities that would affect the pine warbler are known or expected to occur on private property within the analysis area.

The Proposed Action activities of harvest, prescribed burning and herbicide treatment would create pine and pine-oak habitat for nesting and foraging for adult pine warblers, and grassy, herbaceous habitat for post-nesting, migration, and juvenile foraging and maturation, which would be a beneficial cumulative effect.

For the No Action Alternative, forest conditions would continue naturally, and there would be little or no pine and pine-oak habitat for the nesting, foraging, post-nesting, juvenile foraging and maturation needs of the pine warbler. The pine warbler will continue to be absent from the Project Area.

DENSE UNDER- AND MID-STORY IN MESIC MATURE FOREST INDICATOR: HOODED WARBLER (*Wilsonia citrina*)

The hooded warbler prefers dense brushy areas in moist deciduous woodlands or ravines with forest canopy overhead, and sometimes the deciduous understory of mature pine forests. They usually nest in shrubs or saplings, about 2 to 5 feet off the ground. Foraging for insects is done primarily in shrubs up to 15 feet off the ground. Hooded warblers would help to indicate whether habitats such as this are being maintained or developed.

The hooded warbler is an MIS for dense, brushy areas in deciduous woodlands or ravines because of its strong association with these habitats, and because its populations should be responsive to forest management efforts that create and sustain such habitats.

Direct Effects and Indirect Effects

The Proposed Action will create 439 acres of early successional habitat, providing abundant food resources and protective cover for both adult and juvenile hooded warblers immediately post-nesting, during migration, and for juvenile foraging. Because riparian areas are protected from thinning and regeneration treatments, nesting habitat will be maintained within those areas. Herbicides in this alternative may be used within the riparian zone, as long as it is beyond 30 feet from the streambank; however, there should be no effect to the hooded warbler since the herbicide will be spot-applied to the target species. Herbicide treatments are spot treatments to remove competing vegetation. No brushy habitat in riparian areas will be created under this alternative.

The use of prescribed fire may result in some small patches of regeneration, which could benefit this species; however, it is not expected that prescribed fire would burn intensely

in a moist area. If prescribed burning is conducted during the dormant season, the hooded warblers would not be present in the area, so there would be no direct effect such as mortality. With the remaining acres of forest (approximately 90% in the project area would remain as mature forest) that have dense understory, there should be enough mesic, brushy habitat for the hooded warblers to disperse into as necessary, and therefore, no direct effect to the hooded warbler from the proposed actions should occur.

The No-Action Alternative will result in no loss of existing deciduous forest and brushy understory for nesting, but a very limited amount of suitable habitat for post-breeding, juvenile foraging and cover, and migration needs would be present at any given time since only natural processes would be occurring.

Cumulative Effects

On private lands, timber management is likely to occur through small tracts being sold by individual landowners. No large-scale landowners or potential large projects are known in the analysis area that could cause a significant cumulative effect when combined with the proposed action. Additionally, the emerald ash borer *Agrilus planipennis* is active in the project area and throughout the surrounding forests on public and private lands; killing ash trees wherever they encounter them. Dead and dying ash trees could create a small beneficial effect for this species by creating small areas of dense undergrowth through regrowth in the openings in the canopy. There will be no significant negative cumulative effects on the pileated woodpecker from implementing the **Proposed Action**.

The Proposed Action proposes harvest, herbicide treatment and prescribed burning activities that would create early successional habitat; this could be a beneficial cumulative effect as long as the early successional areas needed for post-nesting and juvenile maturation and foraging are maintained. Remaining mature deciduous forest with a dense understory would be available for nesting areas for adult hooded warblers, so there should be no cumulative effect to the hooded warblers.

The No Action Alternative would allow forest processes to continue naturally; however, there will be little early successional habitat for post-nesting and juvenile foraging and maturation needs, which may have a cumulative effect on hooded warbler populations.

Based on the results of long-term monitoring data, hooded warblers indicate overall stable population trends on the GWJNF's and increasing trends in the Appalachian Region (Appendix G – MIS Population Trends Monitoring and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan). Recent research strongly recommends conservation strategies that maintain large tracts of mature forest, within which there is a mosaic of different forest types and ages (early and mid-successional forest stands), as well as mature riparian forest, to provide the habitat requirements needed by migratory birds during all of their life stages here in North America, including the hooded warbler (Kilgo et al. 1999, Suthers et al. 2000, Hunter et al. 2001). With the action alternatives, combined with the maintenance of over 80% of forested acres in mature forest condition the GWJNFs should be able to provide the mosaic of forest types and ages recommended by research for migratory birds such as hooded

warblers during the life history stages (breeding, post-breeding, migration) during which they utilize GWJNF's lands. Hooded warblers exhibit the abundance and distribution across the Forests that will provide for their persistence into the foreseeable future. There should be no cumulative effects to the hooded warbler from implementation of the action alternative.

DRIER MID- TO LATE-SUCCESSIONAL FOREST INDICATOR: SCARLET TANAGER (*Piranga olivacea*)

Scarlet tanagers prefer a drier, mature forest, either oak or oak-pine uplands; they are usually less numerous in the mixed forest type. Scarlet tanagers prefer to nest 30 feet or higher in the tree canopies, and glean insects from the tree foliage.

The scarlet tanager is an MIS for drier, more mature forested habitats because of its strong association with these habitats, and because its populations should be responsive to forest management efforts that create and sustain such habitats.

Direct Effects and Indirect Effects

The Proposed Action would reduce the amount of mid- to late-successional Forest by 439 acres. Approximately 90% of the project area would remain in mature forest, and enough of the drier habitat preferred by the scarlet tanager should remain for its nesting needs. The scarlet tanager would be able to disperse into these areas as needed. There should be no effect to the scarlet tanager from the harvest activities. Herbicides would be used in this alternative, but there should be no effect to the scarlet tanager since the treatments are spot treatments to remove competing vegetation; brushy vegetation and small, widely scattered *Ailanthus* trees would receive the treatment. Prescribed burning is planned for this alternative, but there should be no effect to the scarlet tanager if the burn is conducted according to the set parameters. In addition, the planned prescribed burning should enhance and increase the amount of the pine and pine-oak habitat for nesting and foraging. If the burn is conducted during the dormant season, there would be no scarlet tanagers in the area; therefore, there will be no effect to the scarlet tanager from these activities.

The No-Action Alternative will result in no loss of existing mature forest for nesting, but there will be a very limited amount of suitable habitat for post-breeding, migration, and juvenile foraging and cover needs.

Cumulative Effects

The Proposed Actions of timber harvest, herbicide treatment, and prescribed burning would create early successional habitat for post-nesting, migration, and juvenile foraging and maturation, which would be a beneficial cumulative effect as long as the early successional habitat is maintained as such. The majority of the project area would remain in mature forest, and the pine and pine-oak habitat would increase, so there should be no cumulative negative effects to the scarlet tanagers.

The No Action Alternative would allow the forest mature naturally, and there would be little early successional habitat for the post-nesting, juvenile foraging and maturation needs

of the scarlet tanager. This may have a cumulative effect on the population of the scarlet tanager in the project area.

USGS BBS data indicates a variable but overall stable trend of scarlet tanagers in the Appalachian Region. USFS Avian Monitoring data also indicates a stable trend for scarlet tanager on the GWJNFs (Appendix G – MIS Population Trends Monitoring and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan). Recent research strongly recommends conservation strategies that maintain large tracts of mature forest, within which there is a mosaic of different forest types and ages (early and mid-successional forest stands), to provide the habitat requirements needed by migratory birds during all of their life stages here in North America, including the scarlet tanager (Kilgo et al. 1999, Suthers et al. 2000, Hunter et al. 2001). With the action alternatives, combined with the maintenance of over 80% of forested acres in mature forest condition (George Washington and Jefferson Detailed Monitoring and Evaluation Report for Fiscal Year 2004, Appendix G: Population Trends of Management Indicator Species), the GWJNFs should be able to provide the mosaic of forest types and ages recommended by research for migratory birds such as scarlet tanagers during the life history stages (breeding, post-breeding, migration) that they utilize GWJNF lands. Scarlet tanagers exhibit the abundance and distribution across the Forests that will provide for their persistence into the foreseeable future. There should be no cumulative effects to the scarlet tanager from the action alternative.

EARLY-SUCCESSIONAL FOREST INDICATOR: EASTERN TOWHEE (*Pipilo erythrophthalmus*)

The eastern towhee prefers brushy and overgrown areas, such as overgrown fields or early successional forest. They are found in woodland margins, thickets, woodland understory, cutover woods, and shrubbery in residential areas. The eastern towhee nests in thickets or brushy places on the ground, or possibly in shrubs up to 5 feet off the ground. Foraging is done on the ground by scratching in the leaf litter to find insects, seeds and fruits.

The towhee is an MIS for early-successional habitats because of its strong association with these habitats, and because its populations should be responsive to forest management efforts that create and sustain such habitats.

Direct Effects and Indirect Effects

The Proposed Action proposes prescribed fire, harvest treatments, and herbicide treatments that would create patches of shrubs and saplings, which would benefit this species. Thinning treatments would create limited shrub and sapling development, resulting in some beneficial effect for this species. Regeneration treatments would stimulate thick growth of shrubs and saplings over 439 acres, creating habitat beneficial to the eastern towhee for all its life stages. The use of prescribed fire may result in some small patches of regeneration which would benefit this species. Herbicides would be used in this alternative, and the treatments are spot treatments to remove competing vegetation. The eastern towhee may benefit from the herbicide treatment since some of the treatments

would remove competing non-native vegetation from the early successional habitat preferred by the eastern towhee.

Reconstruction of temporary roads and openings would have a beneficial effect on the eastern towhee since early successional habitat would be created. Skid trails would have a beneficial effect on the eastern towhee until the skid trails revert back to mature forest.

The No-Action Alternative, and will result in no additional early successional habitat, resulting in limited suitable habitat for the eastern towhee.

Cumulative Effects

The Proposed Action harvest, herbicide treatment, and prescribing burning activities would have temporary beneficial cumulative effects for the eastern towhee for approximately 10 to 15 years in the harvest units and indefinitely along the edges and within the prescribed burn units where open habitats are maintained. Any past, present, or future timber management on private property in the Project Area would have a cumulative, beneficial effect for eastern towhee.

The No Action Alternative would have no cumulative effect to eastern towhees since there are no acres of early successional habitat in the project area, and only openings created through natural processes would occur. The forest would continue to mature naturally.

USGS BBS data indicates a steady decline until the 1990s, then an overall stable trend of eastern towhees in the Appalachian Region. USFS Avian Monitoring data also indicates a stable trend for eastern towhee from the 1990s to 2014 on the GWJNFs. (Appendix G – MIS Population Trends Monitoring and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan).

Eastern towhees have exhibited significant continental population declines in the last couple of decades, mirroring an overall trend of decline of disturbance-dependent bird species associated with open habitats in eastern North America (Vickery 1992, Askins 2000, Hunter et al. 2001). A significantly greater proportion of bird species exhibiting steep population declines are associated with disturbance-mediated habitats than forested or generalist habitat types (Brawn et al. 2001). Forty percent of all North American species associated with some type of disturbance-mediated habitat (grassland, shrub-scrub, open woodlands) have been significantly decreasing in population since 1966 (Brawn et al. 2001). Combined with recent research highlighting the importance of early successional woody habitat for post-breeding and migratory stop-over needs of forest-interior migratory bird species in a larger landscape of mature forest (see sections on ovenbirds and hooded warblers), the role of early successional habitat in largely mature, forested landscapes and the need to restore/maintain disturbance regimes creating such habitats is of vital importance in conservation planning (Brawn et al. 2001, Hunter et al. 2001). In the action

alternative, creation of early successional habitats should have a beneficial effect for the eastern towhee.

DEMAND SPECIES

The Jefferson National Forest provides large public ownership with opportunities for hunting, fishing, and wildlife viewing. The following species are selected as Management Indicator Species where effects of national forest management are important to meeting public demand. Monitoring of hunting/harvests will indicate whether management of the habitat is being done at appropriate levels.

EASTERN WILD TURKEY (*Meleagris gallopavo*)

The Wild Turkey (*Meleagris gallopavo*) was selected because it is a species commonly hunted and its population is of public interest. It is a species whose habitats may be influenced by management activities (GWNF FEIS Appendix page J-12, 2004 JNF Plan FEIS, page 3-138). It is one of the MIS for Monitoring Question 8 (*What are the trends for demand species and their use?*) in the 2004 JNF Plan.

Eastern wild turkeys need several successional stages for their lifespans: mature forests are needed for mast production, brushy areas are needed for hiding of the nests, and open grassy or herbaceous areas are needed for poult bugging areas.

Turkey populations benefit from the increase in nesting habitat created by the increase in ground level cover and increased brood range. The revegetation of skid roads and log landings would provide grass/forb habitat resulting in an improved source and distribution of insects (especially grasshoppers) and associated protein for young turkeys (poults). The selection of good mast producers as reserve trees would insure a continuous supply of mast within harvested areas. Hard mast (acorn) production would not decline significantly in the project area; in fact, it would be expected to increase through time given treatments which will increase mast production such as prescribed fire, which would enhance oak establishment for the future.

Direct and Indirect Effects

The Proposed Action proposes regeneration and thinning cuts, herbicide treatments, and prescribed burning. The thinning will create some patches of brushy habitat that will benefit the wild turkeys during the nesting and bugging seasons, and the regeneration cuts will create 439 acres of brushy habitat. The brushy areas will benefit the turkeys and poults while the early successional stage persists: 10 to 15 years for the harvest areas and as long as the permanent openings are maintained. The acres of mature forest (90%) that will remain in the project area will provide mast (acorns, hickory nuts, etc) that will benefit mature turkeys in the fall and winter. Herbicide treatments are spot treatments to remove competing vegetation. There should be no adverse effects to the wild turkey from the herbicide treatments. Early spring prescribed burning could possibly destroy nests and eggs, but turkey hens will often nest again when the eggs are destroyed through natural processes such as predation by raccoons or coyotes. The overall improvement to habitat in the following years should benefit the wild turkey.

Construction of temporary roads and openings should have a beneficial direct effect on the wild turkey since there would be a temporary increase in foraging and maturation opportunities for young turkeys. Skid trails could have a temporary direct effect on the turkey by crushing individual nests during logging operations. However, adult birds would be able to escape the immediate area and nest elsewhere in the remaining forest.

The **No Action Alternative**, will not provide more openings for wild turkeys, but the mature forest will remain, providing mast for turkeys in the fall and winter seasons. There will be a lack of openings that would be used by hens and poults for nesting and foraging, other than those created naturally through tree-fall or wildfires.

Cumulative Effects

The Proposed Action proposes harvest activities, herbicide treatments and prescribed burning will create some patches of brushy habitat that will benefit the wild turkeys during the nesting and bugging seasons; the brushy areas will benefit the turkeys and poults while the early successional stage persists: 10 to 15 years for the harvested areas, and as long as the permanent openings are maintained. The acres of mature forest (90%) that will remain in the project area will provide mast (acorns, hickory nuts, etc) that will benefit turkeys in the fall and winter. No known activities are planned on private lands in the project area that will have a cumulative effect when combined with the proposed action.

The **No Action Alternative** will allow forest processes to occur naturally. There will be little early successional habitat for the adult turkeys' foraging and poult bugging, so the cumulative effect for the wild turkey could be a reduction in numbers.

USGS BBS data indicates an increasing trend of Wild turkeys in the Appalachian Region (Appendix G – MIS Population Trends Monitoring and Evaluation Report FY2008 through FY2014 for the 1993 George Washington National Forest Land and Resource Management Plan and 2004 Jefferson National Forest Land and Resource Management Plan). With the action alternatives, proposed projects such as this, combined with the maintenance of over 80% of forested acres in mature forest condition, the GWJNFs should be able to provide the mosaic of forest types and ages recommended by research for avian species such as wild turkey during the life history stages (breeding, post-breeding, wintering) during which they utilize GWJNF lands. Wild turkeys have the abundance and distribution across the Forests that will provide for their persistence into the foreseeable future. Both action alternatives should have beneficial effects for the wild turkey population in the project area and immediately adjacent areas.

BLACK BEAR (*Ursus americanus*)

Black bears need large areas with little or no disturbance such as repeated interaction with humans. Black bears use different successional stages for their needs. Mature forests provide mast such as acorns or beech nuts, as well as snags for denning, and early successional habitat provides berries and green vegetation for foraging.

Most of the diet of black bears comes from vegetable matter such as hard and soft mast, succulent herbaceous material and fruits of evergreen shrubs and vines. Animal foods such as insects, honey, fish, frogs, small rodents, rabbits, fawns, bird eggs, and carrion make up about 3% of their annual diet. (Linzey, 1998) Soft mast becomes a very important food source in late summer through fall for building stores of body fat. Body fat is a critical factor in bear survival and reproduction.

Potential den trees are those greater than 20 inches diameter at breast height (DBH). Potential den trees also include those that are hollow with broken tops or those with limbs greater than 12 inches diameter, broken near the bole of the tree. These trees are identified when marking commercial timber sales and are marked as leave trees. Thinning and regeneration treatments will mark and protect snags (see mitigation measures), and should result in little additional loss of cavities beyond natural disturbance processes. Prescribed burning may also create scattered tree mortality, resulting in new snags and downed wood, which would benefit the black bears.

System roads within the proposed project area will be gated and permanently closed following project work; there should be no effect to black bears from vehicle traffic such as would occur on open roads.

Direct and Indirect Effects

The thinning treatments, regeneration treatments, herbicide treatments and prescribed burning in **the Proposed Action** would create patches of early successional habitat, and 439 acres of early successional habitat would be created by the regeneration treatments, providing increased soft mast production from species such as grape, blueberry, blackberry, greenbrier and other species. The remaining mature forest within the project area (90% of the project area) would continue to provide the hard mast such as acorns, hickory nuts, etc. Thinned areas would have increased acorn production due to the removal of competing vegetation from the oak-areas. The use of prescribed fire would enhance oak establishment since oak species are fire-tolerant; the fire-intolerant species would be “knocked back” or killed with the prescribed fire. Herbicide treatments are spot treatments to remove competing vegetation. Reconstruction of temporary roads and openings should have no direct effect on the black bear since there would be a vast majority of the mature forest remaining, and the openings present foraging opportunities for soft mast and low green vegetation. There should be beneficial effects to the black bear from these activities.

The **No Action Alternative**, will result in no loss of existing mature forest, but will provide only a very limited amount of suitable early successional habitat for black bear from natural processes. This alternative would not provide necessary black bear habitat components since no early successional habitat would be created to meet the soft-mast and green vegetation needs of the black bears.

Cumulative Effects

The Proposed Action harvest activities, herbicide treatments and prescribed burning will create some patches of brushy habitat that will benefit the black bear by providing green leafy material, grubs, insects, and later, berries and other soft mast; the brushy areas will

benefit the black bear while the early successional stage persists - 10 to 15 years for the harvested areas, and as long as the permanent openings are maintained. The acres of mature forest (90%) that will remain in the project area will provide mast (acorns, hickory nuts, etc.) that will benefit black bears in the fall and winter. No known activities are planned on private lands in the project area that will have a cumulative effect when combined with the proposed action.

The No Action alternative would allow forest processes to occur naturally. There will be little early successional habitat for the black bear's foraging.

Since 2001, trends in harvest and population modeling suggest that the bear population throughout the area encompassing the GWNF has been increasing at about 9% annually (VDGIF 2013; WVDNR 2013). With proposed projects such as this, combined with the maintenance of over 80% of forested acres in mature forest condition, the GWJNFs should be able to provide the mosaic of forest types and ages recommended by research for species such as black bear for its life history needs on GWJNF lands. Black bears have the abundance and distribution across the Forests that will provide for their persistence into the foreseeable future. There should be beneficial effects to the black bear and its habitat from the action alternative.

WHITE-TAILED DEER (*Odocoileus virginianus*)

White-tailed deer are generalists, using a variety of habitat types. Mature forests provide mast, brushy areas provide hiding cover and browse, and early successional areas provide browse, berries and herbaceous plants for eating. A mixture of habitat types and resulting edge insures that an abundant food source is available throughout the year. White-tailed deer heavily use hard mast in the fall (usually acorns) and accumulate sustaining fat reserves for the winter.

Direct and Indirect Effects

The Proposed Action proposes thinning treatments, regeneration treatments, herbicide treatments, and prescribed burning. The thinning treatments would create patches of early successional habitat, providing food resources for white-tailed deer, and the regeneration treatments would provide 439 acres of early successional habitat. An increase in browse availability would benefit the local deer population, and any localized increases in deer populations would not be expected to create problems for adjacent private landowners given the hunting pressures on public lands. Good acorn crops usually mean higher reproductive rates and better antler development for deer. Even with tree harvest, hard mast (acorn) production would be expected to increase through time, given treatments which would increase mast production: the thinning would remove competition for the oak trees, and the remaining mature forest in the project area (90%) would continue to provide hard mast for the white-tailed deer. The use of prescribed fire would enhance oak establishment for the future due to the "knocking-back" or killing of fire-intolerant plant species from the project area. Oak species are fire-tolerant. Herbicide treatments are spot treatments to remove competing vegetation. Reconstruction of temporary roads and openings should have no direct effect on the white-tailed deer since there would be a vast

majority of the mature forest remaining, and the openings present foraging opportunities. Skid trails should have no effect on the white-tailed deer since they are not constructed and are temporary. There should be beneficial effects to the white-tailed deer from these activities.

The Proposed Action proposes thinning treatments, regeneration treatments, herbicide treatments, and prescribed burning. The thinning treatments would create patches of early successional habitat, providing food resources for white-tailed deer, and the regeneration treatments would provide 319 acres of early successional habitat. An increase in browse availability would benefit the local deer population, and any localized increases in deer populations would not be expected to create problems for adjacent private landowners given the hunting pressures on public lands. Good acorn crops usually mean higher reproductive rates and better antler development for deer. Even with tree harvest, hard mast (acorn) production would be expected to increase through time, given treatments which would increase mast production: the thinning would remove competition for the oak trees, and the remaining mature forest in the project area (90%) would continue to provide hard mast for the white-tailed deer. The use of prescribed fire would enhance oak establishment for the future due to the “knocking-back” or killing of fire-intolerant plant species from the project area. Oak species are fire-tolerant. Herbicide treatments are spot treatments to remove competing vegetation. Reconstruction of temporary roads and openings should have no direct effect on the white-tailed deer since there would be a vast majority of the mature forest remaining, and the openings present foraging opportunities. Skid trails should have no effect on the white-tailed deer since they are not constructed and are temporary. There should be beneficial effects to the white-tailed deer from these activities.

The **No-Action Alternative** will result in no loss of existing mature forest, but will provide a very limited amount of suitable early successional habitat for use by white-tailed deer, as would be expected with natural forest processes. Deer populations would eventually shift toward the edges of the project area where early successional browse is readily available.

Cumulative Effects

The Proposed Action harvest activities will create patches of brushy habitat that will benefit the white-tailed deer by providing green leafy material, browse, and cover. The acres of mature forest (90%) that will remain in the project area will provide hard mast (acorns, hickory nuts, etc.) that will benefit white-tailed deer in the fall and winter. There should be no effects to the white-tailed deer from the herbicide treatments; removal of the non-native plant species will benefit the white-tailed deer by enhancing the natural diversity of the project area, and removal of the undesirable vegetation will enhance mast-tree growth and eventual mast production. Prescribed burning will have a beneficial effect for the white-tailed deer by creating patches of early successional habitat; the overall improvement to habitat in the following years should benefit the white-tailed deer. Overall, the harvest, herbicide treatments and prescribed burning should have beneficial cumulative effects for the white-tailed deer. Road reconstruction should have no negative cumulative effect on the white-tailed deer since early successional habitat will be created along the road edges, providing foraging opportunities and the roads will remain closed. No known

activities are planned on private lands in the project area that will have a cumulative effect when combined with the proposed action.

Current population reconstruction models indicate that Virginia's statewide deer population has been relatively stable over the past decade, fluctuating between 850,000 and 1,000,000 animals (VDGIF 2012). Since 2000, VDGIF harvest data has suggested a more substantial decline across much of the GWJNF (George Washington and Jefferson Detailed Monitoring and Evaluation Report for Fiscal Year 2004, Appendix G: Population Trends of Management Indicator Species). With proposed projects such as this, combined with the maintenance of over 80% of forested acres in mature forest condition, the GWJNFs should be able to provide the mosaic of forest types and ages recommended by research for species such as white-tailed deer for its life history needs on GWJNF lands. White-tailed deer have the abundance and distribution across the Forests that will provide for their persistence into the foreseeable future. There should be beneficial cumulative effects for the white-tailed deer with the proposed action.

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